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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/579,576	05/25/2000	Ho-Jin Kweon	003364.P048	7384

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EXAMINER

WILLS, MONIQUE M

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 05/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/579,576

Applicant(s)

KWEON ET AL.

Examiner

Monique M. Wills

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5,8,9,16-22 and 29-35 is/are pending in the application.
- 4a) Of the above claim(s) 1,8 and 16-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5,9 and 29-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 May 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

This Office Action is responsive to the Amendment filed February 21, 2006. The rejections are maintained as follows:

- Claims 5, 29, 30, 33 & 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka U.S. Patent 5,869,208, in view of Kawakami et al. U.S. Pat. 5,641,591.
- Claims 5, 29, 30, 33 & 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Kawakami et al. U.S. Pat. 5,641,591.
- Claim 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Kawakami et al. U.S. Pat. 5,641,591 and further in view of Matsubara U.S. Pub. 2001/0010807.
- Claims 5, 9, & 29-32 are rejected under 35 U.S.C. 103(a) being unpatentable over Gosho et al. U.S. Patent 6,589,69490 and further in view of Kawakami et al. U.S. Pat. 5,641,591.

Claims 1, 8, 16,-22, 30 have been cancelled by Election by Original Presentation. As a result, the following rejections will be reapplied once the election is reversed. The following rejections are temporarily withdrawn:

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- Claims 1, 16, 17, 20, 21, & 37 under 35 U.S.C. 103(a) as being unpatentable over Miyasaka U.S. Patent 5,869,208, in view of Kawakami et al. U.S. Pat. 5,641,591.
- Claims 1, 16, 17, 20 & 21 under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Kawakami et al. U.S. Pat. 5,641,591.
- Claim 22 under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Kawakami et al. U.S. Pat. 5,641,591 and further in view of Matsubara U.S. Pub. 2001/0010807.
- Claims 1, 8 & 16 -19 under 35 U.S.C. 103(a) being unpatentable over Gosho et al. U.S. Patent 6,589,69490 and further in view of Kawakami et al. U.S. Pat. 5,641,591.

Election/Restrictions

Newly submitted claims 1,8 & 16-22 directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: the claims are now drawn to a rechargeable lithium battery instead of a positive active material slurry.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 1,8 & 16-22

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are withdrawn from consideration as being directed to a non-elected invention.

See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 29, 30, 33 & 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka U.S. Patent 5,869,208, in view of Kawakami et al. U.S. Pat. 5,641,591.

With respect to claim 5, Miyasaka teaches: a physical mixture of a lithiated transition metal compound (col. 11, lines 10-20); a powder metal including *aluminum* (col. 8, lines 10-15); a carbon black conductive agent (col. 8, lines 5-10); a binder (col. 8, lines 30-45); an organic electrolyte solution (col. 8, lines 48-53); the active material includes LiCoO_2 , embracing formula 7, when B is Co and A is O (col. 5, lines 15-25); and the metal additive is 2 to 15 wt % of the active material (col. 8, lines 15-20). With respect to claims 29 & 30, the active material includes LiCoO_2 embracing LiBA_2 and $\text{LiBO}_{2-z}\text{A}_z$ when B

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is Co and A is O (col. 8, lines 15-25). With respect to claims 33 & 34, the active material is LiCoNiO_2 , embracing LiNiCoA_2 and $\text{LiNiCoO}_{2-z}\text{A}_z$ when A is oxygen (col. 8, lines 15-25).

Miyasaka is silent to an electrode additive of at least one of Si, B, Ti, Ga, Ge, Ca, Mg, Sr and Ba (claim 5).

However, Kawakami teaches the equivalence of aluminum and magnesium metallic powder as conductive agents in electrode materials for improving electrode conductivity. See column 14, lines 45-55.

Miyasaka and Kawakami are analogous art, because they are from the same field of endeavor, namely, fabricating lithium lithium electrochemical cells.

Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the instant invention was made because even though Miyasaka does not teach titanium conductive agents, Kawakami teaches that aluminum and magnesium are art recognized equivalent materials for use as conductive agents in lithium transition metal oxide cathodic materials, and therefore one having ordinary skill in the art would have substituted one conductive agent for the other.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 29, 30, 33 & 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Kawakami et al. U.S. Pat. 5,641,591.

Saidi teaches a rechargeable lithium battery (abstract). With respect to claim 5, Saidi teaches a slurry composition comprising: a physical mixture of a positive active material including LiMnO_4 , LiCoO_2 , LiNiO_2 , LiNiVO_4 , LiCoVO_4 , LiCoNiO_2 or LiTmO_2 where Tm is a transition metal or combination of transition metals (col. 6, lines 10-20); a binder (col. 9, lines 10-15); a carbon conductive agent (col. 9, lines 15-20); and an organic solvent (col. 9, lines 65-68); coated onto a current collector and dried (col. 9, lines 15-21 & 60-68); and the positive active material includes LiCoO_2 (instant formula 3), LiNiO_2 (instant formula 3) or LiCoNiO_2 (instant formula 11). See column 6, lines 10-20. With respect to claim 29, the active material is LiCoO_2 embracing the formula Li_xBA_2 when $x=1$ and A is oxygen (col. 6, lines 10-20). With respect to claim 30, the active

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material is LiCoO_2 embraces the formula $\text{Li}_x\text{BO}_{2-z}\text{A}_z$ when $x=1$ and A is oxygen (col. 6, lines 10-20). With respect to claim 33, the active material is LiCoNiO_2 , embraces the formula $\text{Li}_x\text{NiCoA}_2$ when $x=1$ and A is oxygen (col. 6, lines 10-20). With respect to claim 34, the active material is LiCoNiO_2 , embraces the formula $\text{Li}_x\text{NiCoO}_{2-z}\text{A}_z$ when $x=1$ and A is oxygen (col. 6, lines 10-20).

Saidi is silent to an electrode additive of at least one of Si, B, Ti, Ga, Ge, Ca, Mg, Sr and Ba, in an amount of 0.01 to 10wt% (claim 5).

However, Kawakami teaches that it is conventional to employ magnesium conductive agents in electrodes of lithium cells to improve conductivity of the electrode. See column 14, lines 45-55. With respect to claims 1 & 5, the conductive agent may be added in an amount up to 10% by weight (col. 4, lines 15-30).

Saidi and Kawakami are analogous art because they are from the same field of endeavor, namely, fabricating rechargeable lithium cells.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the magnesium conductive agent of Kawakami in the positive electrode of Saidi, in order to increase conductivity of the positive electrode.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al., U.S. Patent 5, 851,696 in view of Kawakami et al. U.S. Pat. 5,641,591 and further in view of Matsubara U.S. Pub. 2001/0010807.

Saidi in view of Kawakami teach an active slurry composition as described hereinabove. Saidi teaches a positive active material comprising LiTmO_2 , where Tm is a combination of transition metals (col. 6, lines 15-20).

Saidi does not expressly disclose a lithium nickel/cobalt material of the formula $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}^n\text{A}_2$.

However, Matsubara teaches that it is conventional to employ lithium nickel/cobalt oxides of the formula $\text{Li}_y\text{Ni}_{1-x}\text{Co}_x\text{M}_{x2}\text{O}_2$ where M is Al, Fe, Mn where y is $0.9 < y < 1.3$ and $0 < x < 0.5$ (§ 13-14). This compound improves the charging and discharging cycle characteristics of the positive electrode so that it retains high battery capacity (abstract).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the instant invention was made, because even though Saidi does not specifically teach $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}^n\text{A}_2$, Matsubara teaches that material of this formula improves the charging and discharging cycle characteristics and battery capacity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5, 9, & 29-32 are rejected under 35 U.S.C. 103(a) being unpatentable over Gosho et al. U.S. Patent 6,589,69490 and further in view of Kawakami et al. U.S. Pat. 5,641,591.

Gosho teaches a positive active material comprising LiCoO_2 , LiNiO_2 , $\text{LiCo}_{1-x}\text{Ni}_x\text{O}_2$, wherein $0.1 < X$ and $Y < 0.1$ (col. 6, lines 15-23). With respect to claim 5, The active material is prepared by mixing a binder, carbon black and N-methyl-z-pyrrolidone to form a slurry (col. 19, lines 45-55), the slurry is applied onto both surfaces of a current collector and dried (col. 19,

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lines 45-55), and the positive active material includes LiCoO_2 (instant formula 3), LiNiO_2 (instant formula 3) or LiCoNiO_2 (instant formula 11). See column 6, lines 15-23. With respect to claim 9, the organic solvent is N-methylpyrrolidone (col. 19, lines 50-55). With respect to claim 29, the active material is LiCoO_2 embracing the formula Li_xBA_2 when $x=1$ and A is oxygen (col. 6, lines 15-23). With respect to claim 30, the active material is LiCoO_2 embracing the formula $\text{Li}_x\text{BO}_{2-z}\text{A}_z$ when $x=1$ and A is oxygen (col. 6, lines 15-23). With respect to claim 31 & 32, the active material is $\text{LiNi}_{1-x}\text{Al}_x\text{O}_2$, embracing the formula $\text{Li}_x\text{B}_{1-y}\text{M}^y\text{A}_z$ when B is Ni, M^y is Al and A is O (col. 6, lines 15-23).

Gosho is silent to an electrode additive of at least one of Si, B, Ti, Ga, Ge, Ca, Mg, Sr and Ba (claim 5) in an amount of 0.01 to 10 wt% (claim 5).

However, Kawakami teaches that it is conventional to employ magnesium conductive agents in electrodes of lithium cells to improve conductivity of the electrode. See column 4, lines 15-30. Further, with respect to claims 1 & 5, the conductive agent may be added in an amount up to 10% by weight (col. 4, lines 15-30).

Gosho and Kawakami are analogous art because they are from the same field of endeavor, namely, fabrication rechargeable lithium cells.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ the magnesium conductive agent of Kawakami in the positive electrode of Gosho, in order to increase conductivity of the positive electrode.

Response to Arguments

Applicant contends that Kawakami does not cure the deficiencies of the primary references Miyasaka, Saidi and Gosho, because there was a failure to establish a prima facie case of obviousness. Specifically, there was no motivation to combine Kawakami with said primary references. However, the Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. *In re Nomiya*, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated by the references. The test for combining references is what the combination of disclosures taken as a whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971). References are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. *In re Bozek*, 163 USPQ 545 (CCPA 1969). In the instant case, Kawakami teaches the equivalence of aluminum and magnesium as conductive material in electrodes of lithium batteries. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See also *In re Leshin*, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) (selection of a known plastic to make a container of a type made of plastics

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prior to the invention was held to be obvious). Therefore, the fact that Kawakami teaches the equivalence of aluminum and magnesium as equally suitable as conductive materials establishes a prima facie case of obviousness.

Applicant also asserts that the 2 to 5% of the electroconductive material disclose in Miyasaki is the amount of the electroconductive material and not the metal additive. That is, Miyasaki is silent on the metal conductive material being used in a mixture of metal and a carbon conductive material. This argument is not persuasive. Specifically as column 8, lines 5-20, Miyasaki teaches that the electronically conductive material may be a mixture of a carbon/graphite material and a metal powder, in an amount of preferably 2 to 15 wt%. See the except below.

Examples of the electroconductive materials are electro-conductive materials which are chemically stable in the battery and include naturally produced graphites such as flake graphite, massive graphite, synthetic graphite, carbon black, acetylene black, ketchen black, carbonaceous fibers, powder of metal (e.g., copper, nickel, aluminum, or silver), metal fibers, and polyphenylene derivatives. These materials can be employed singly or in combination. Particularly preferred is a combination of graphite and acetylene black. The amount of the electro-conductive material incorporated into the electrode material is generally not more than 50 wt. %, preferably 1 to 50 wt. %, more preferably 2 to 30 wt. %. When carbon or graphite is employed, its amount preferably is in the range of 2 to 15 wt. %.

Therefore, the rejections with respect to Miyasaki and Kawakami are maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (571) 272-1309. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Michael Barr, may be reached at 571-272-1414. The

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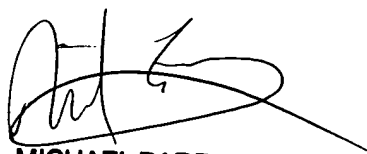
fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MW

5/15/06

A handwritten signature in black ink, appearing to read 'Michael Barr', with a stylized flourish extending from the end.

MICHAEL BARR
SUPERVISORY PATENT EXAMINER